

# INDUSTRIAL EXPERIENCE

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## ANNEALING FURNACES: QUALITY COMPETITION WINNERS

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Steklomash Works specializes in the production of large-capacity machinery for the glass industry, which is known for its high quality.

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Steklomash Works is the only machine-building company in Russia producing large engineering machinery for the glass industry.

The company produces automated complexes, production lines, and heat-treatment machines which are successfully operated at 300 FSU glass factories and in many foreign countries, such as Germany, India, Egypt, Mexico, Algeria, Iraq, Bulgaria, Hungary, Romania, Slovakia, and Cuba.

The glass-manufacturing lines made by Steklomash Works produce polished sheet glass, glass containers, car, building, and laminated glass, construction glass bricks, high-voltage hardened glass insulators, and slag ceramized glass products.

Steklomash produces annealing furnaces and hydraulic presses with microprocessor control. As in many Russian industrial enterprises, it suffered from the industrial slump which was later overcome and now the company has resumed intense operations and its growth rate is accelerating.

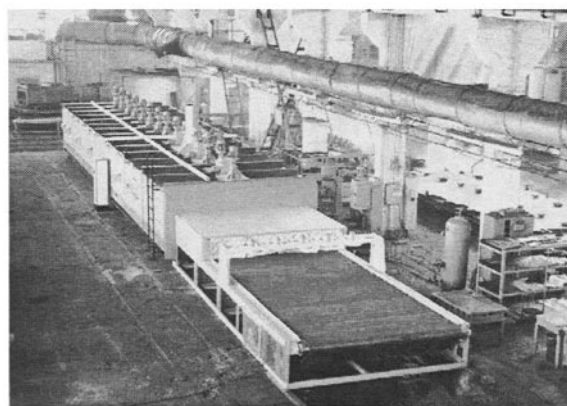
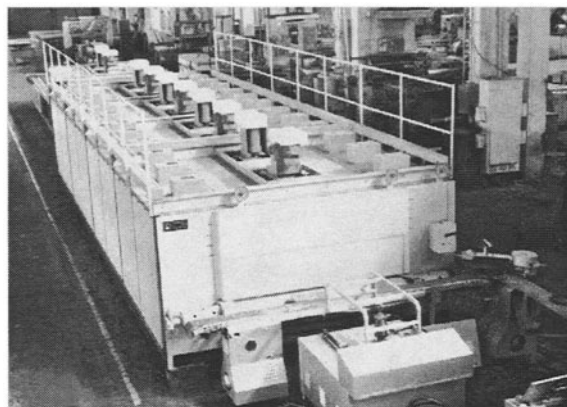
The production volume has increased 4 times, and the number of employees in 1999 grew by 25%.

The company production program includes annealing furnaces, loading and discharge equipment, shrink-film wrapping lines for glass product packaging, electric hydraulic presses, and machines for high-voltage insulated and glass bricks. The amount of grid produced for annealing furnaces has substantially increased and the quality has been improved significantly. Currently negotiated contracts include float-glass equipment, export of float-glass lines, and laminated car and building glass production lines.

New types of machines have been added to the product range: batch processing machines, including glass scrap crushers, batch mixers, and wide-table batch loaders. Edge-processing and facet-removal machines for sheet glass are

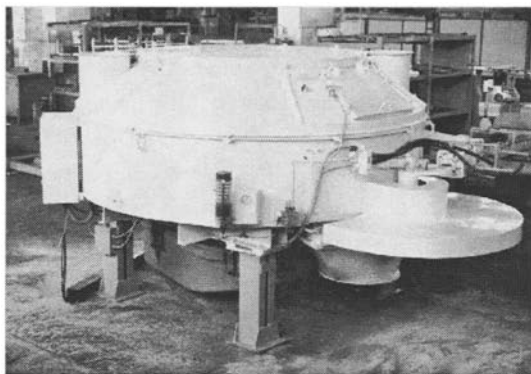
being prepared for production. Equipment for foam concrete production is being produced as well.

An extremely interesting and promising prototype is now nearing completion, namely, a jet-rotary grinder for superfine milling (up to 5  $\mu\text{m}$ ) of raw materials. This new machine

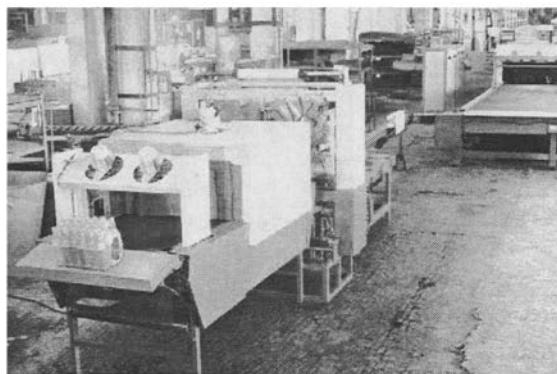


Annealing furnaces

<sup>1</sup> Steklomash Works, Orel, Russia.



Batch mixer



Wrapping line

promises to have a substantial impact on in glass and ceramic production.

Starting in 1999, our company started to exhibit our machines at domestic and international exhibitions and got positive evaluations.

The All-Russia Exhibition Center organized a competition "Best domestic product" within the framework of the Russian regions-99 Exhibition, and our glass annealing furnaces were awarded an Honorary Diploma.

At the exhibitions "Best Products and Services on Russian Markets-99" the company received the Golden Prize and the title "A Rating Leader in the Best Russian Products Promotion Program."

In February 2000 the results of the national "Russian Trademark" competition for 1999 were announced at the Manege Central Exhibition Hall. Our company was named the laureate of the competition and the PKE-323 and PKG-324 annealing furnaces received the Sign of Quality Golden medals.

The annealing furnaces also received a diploma from the competition "The best of Russia" at the exhibition "Porcelain. Glass. Ceramics-2000."

The last in this series is our achievement at the prestigious competition titled "Russian Trademark. Third Millennium. Sign of Quality of the XXI century" that was held in April 2000. In spite of highly competitive selection, PKÉ-1423 and PKG-1423 received gold medals, and the machines for glass bricks and laminated glass production received silver medals. Our company was named the winner of this competition.

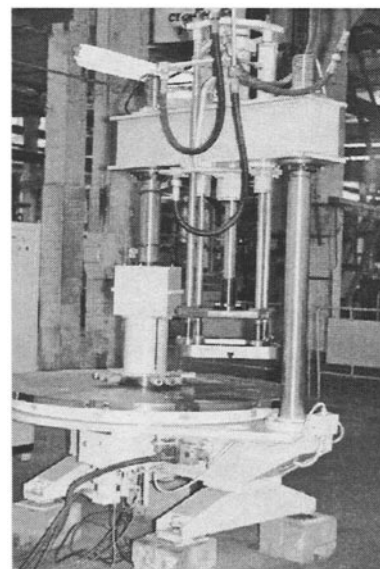
A significant place in machinery production of the company is occupied by annealing furnaces for glass products, which deserve special mention. The company has extensive expertise in such equipment: in 25 year of manufacturing, Steklomash Works produced about 750 furnaces used in the glass industry of Russian and the CIS countries.

Close contact with the Orel SKB SM (earlier known as GSPKB), the developer of all annealing furnace designs, made it possible to refine the design and technology of serially produced furnaces (width 1100 to 2600 mm) and make them reliable and competitive with foreign analogs.

The following example can be given. When a Russian glass factory which was negotiating a purchase of a set of glass-making machinery from a German company and found themselves short of funds, the vendors offered a compromise solution: "You can buy feeders and glass-molding machines from us, and buy annealing furnaces in Orel: the quality of Orel machinery is good, the price is lower, and we already have experience in using these furnaces with our equipment."

That is true: numerous examples of such cooperation are known: the Sitall Company (Roslavl, Smolensk Region) uses our furnaces with Belgian glass-molding machines, the Kamyshin container glass factory combines its furnaces with German machines, and the Moscow electric lamp factory uses them with Czech glass-molding machines.

In 1999 the Orel SKB SM, at the initiative of its General Director A. V. Antokhin, completed the design for a new generation of annealing furnaces: direct-fired annealing furnaces with gas heating and grid width 3200 mm. For the first time in domestic machine-building, the design involves di-



Hydraulic press

rect burning of gas in the furnace tunnel, which results in saving up to 25% gas, compared to the traditional technology.

The internal section frames and furnace grid will be made of nickel-containing steel Ch18N10T, and the flame tube of steel Ch23N13. The furnace drive is equipped with the frequency speed control block of a standard asynchronous motor. The furnace sections are supplied with lining and are readily installed.

A prototype series of such furnaces has already been made and delivered to RASCO Russian-American Company (Anopino, Vladimir Region), Kavminsteklo Company (Mineral'nye Vody), and Astrakhansteklo Company. The RASCO Company is now testing the furnace in combination with a Czech blow-molding machine.

Exhibitions, seminars, information in specialized journals, and wide market research have their effect: more and more Russian factories are successfully using Russian machinery for glass containers: conveyor belts transporting the products from the molding machine to the annealing furnaces, loaders of glass products, annealing furnaces, product removal units with visual control conveyors, and equipment for wrapping glass containers in shrink film in blocks.

Users are sending in orders for direct-fired annealing furnaces of width 1800 and 1100 mm wide, there is demand for descending equipment, etc. This means that the company is growing, like in good old times, and is starting to function at full capacity.